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ANGLER MARKET SEGMENTATION, ANGLER SATISFACTION, AND ACTIVITY PERSISTENCE AMONG IDAHOANS

by

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THE RELATIONSHIP BETWEEN ANGLER MOTIVATION AND SATISFACTION, WITH SPECIAL EMPHASIS OF THE ROLE OF MARKET SEGMENTATION TO ENHANCE MEASUREMENT AND MANAGEMENT OF ANGLER SATISFACTION

A SYNOPSIS[1]

INTRODUCTION

Satisfaction has long been identified as the principal "product" of the recreation experience (Driver and Tocher 1970, Driver and Knopf 1978, Hendee and Bryan 1978). But what constitutes a satisfying or quality experience is still being debated and researched.

One major goal of this review is to address a question prevalent in studies of consumptive recreation (i.e., fishing and hunting), namely determining the relative importance of harvesting (catching) within the broad range of outcomes that are sought through the fishing. While "multiple satisfaction" is now a well accepted concept, considerable polarization exists among authors relative to the interpretation of the importance and role of harvest and its role in determining satisfaction and activity persistence.

A major barrier facing contemporary recreation satisfaction research is the lack of consensus concerning the meaning of the word satisfaction and how it should be measured. Dictionary definitions underscore this dilemma by offering definitions ranging from *the fulfillment of a need or a want,* to *the achievement of expectations.* This first section of this synopsis will illustrate the diversity of approaches in general use by pointing out how various researchers have defined and measured user satisfaction, and by summarizing the major conceptual, methodological and application approaches that have been used

People fish to catch fish, but fishing quality is not the same thing as success in catching fish, nor does it mean the same thing to all fishermen (Bryan 1979, Talhelm 1979, Graefe 1981, and others). A growing literature suggests that angling satisfaction and quality are subjective constructs and influenced by more variables than catch characteristics.

Table 1 summarizes some of the cornerstone research - techniques, operational definitions, theories and hypotheses - that has been conducted on this elusive topic. Five basic models, or frameworks have been used to measure satisfaction. These are: (1) discrepancy models; (2) cognitive dissonance models; (3) marginal utility models; (4) summation models (of general feelings about elements of the experience/environment); and (5) social and psychological need fulfillment models.

Discrepancy models suggests that expectations about an event influence the amount of satisfaction derived from experiencing the event (Lawler 1973, Peterson 1974, Roggenbuck and Schreyer 1977). Expectations not met result in dissatisfaction (Anderson 1980, Becker et al. 1981, McCool 1982). Although conceptually simple, and widely applied, the empirical evidence is weak. Propst and Lime (1984) highlight its major weakness by citing the fact that most applications of this approach to river recreation have shown that users are all very highly satisfied, regardless of their expectations. Dorfman (1979) found that overall satisfaction depended most on people experiencing events that they considered most

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Table 1. Summary of corner-stone models of recreation satisfaction

Citation	Population	Model	Operationalization	Elements of satisfaction	Elements of Dissatisfaction
Stankey et al. 1973	Montana deer hunters	Summated	Harvest success, dominant but one of many	Game bagged, game seen, opportunity to escape, natural environment	
Peterson 1974	Wilderness canoeists	Discrepancy	Function of the desired and perceived degree of presence of factors	clean water, natural sounds, mature forests, views and scenic quality, adequate signing, natural environments	Litter, biting insects, vandalism, motor boats, poor fishing, dirty water
Dorfman et al 1976	Dispersed and developed campground users (MT)	Several	Composed of several elements	Ability to participate in several activities, scenic quality, uncrowded camps, weather, wildlife, quite, escape	Bad weather, crowding, noise, litter, insects, absence of conveniences (water, firerings, garbage cans, etc.)
Roggenbuck and Schreyer 1977	Utah river floaters	Discrepancy	Difference between desired and perceived outcomes	action, excitement, learning about nature, stress release, solitude	
Becker et al. 1981	Wisconsin, Minnesota river users	Summation	Function of perceived density and satisfaction with specific elements		Crowding, limited beach areas, unsafe boaters, limited public facilities, pollution, litter, commercial barges
Ditton et al. 1981	Arkansas floaters	Discrepancy	Function of satisfaction with several elements	Scenery, thrills, good management, escape, natural undamaged river environment	few rapids, crowded
Dorfman 1979	Montana campers	Discrepancy and summation models	8 different definitions based on different combinations of elements that where important, experienced, desired, or expected	Absence of negative factors, social encounters	presence of negative factors
Beard and Rhageb 1980	eclectic/convenience	Needs fulfillment	Degree of fulfillment	59 specific items	psychological escape, education, social relaxation, physiological escape, aesthetics
Manning and Ciali 1980	Vermont floaters	Cognitive dissonance	Satisfaction related to user density		Density when the number of others users is perceived as "Crowding"

Citation	Population	Model	Operationalization	Elements of satisfaction	Elements of Dissatisfaction
Pierce 1980	San Francisco	Needs fulfillment	Degree of fulfillment at work and leisure	Intimacy, relaxation, achievement	
Walsh 1980, and Walsh and Gilliam 1980	Colorado Wilderness users	Marginal utility	Congestion is negatively related to satisfaction		Encounters beyond some optimal level (reported not experienced)

valuable or desirable, and least on what they expected. Thus if expectations are important, other factors are probably more important (Schreyer and Roggenbuck 1978).

Cognitive dissonance models contend that because most people have substantial investments of time and money in recreational pursuits they force themselves to report high satisfaction regardless of their actual experience. In other words, people will be satisfied regardless of the discrepancy between their expectations and their experiences. Manning and Ciali (1980) showed that except in unique, once-in-a-lifetime, or extremely expensive situations cognitive dissonance has not been a viable approach.

Marginal utility models assume a negative relationship between satisfaction and levels of use (visitor density) (Fisher and Kurtilla 1972). At the point where the marginal satisfaction of the next visitor no longer exceeds the decrease in the satisfaction of the earlier visitors, total satisfaction begins to decrease and the social capacity is approached. The predominant finding in the literature is one of weak relationships between satisfaction and user density (Shelby and Nielson 1976, Cheek and Burch 1976, Shelby 1976, and others). Heberlein (1977) and others have argued that because crowding is a fluctuating normative variable that is more complex than the number of people present, it should include measures of the types and acceptability of the behaviors of other recreationists and measures of group and social norms.

If there is one area in which the operationalization of the three models described above (discrepancy, cognitive dissonance, and marginal utility) have all failed is that they treated recreation as a single activity. Research conducted on most major outdoor recreation pursuits since the mid 1970's, including angling and hunting, have established that recreation is a multi-dimensional experience. That is, participation is motivated by packages of several diverse motivational factors, and people seek to fulfill multiple goals. Summation models and social and psychological need fulfillment models are two related approaches to measuring satisfaction that build upon these psycho-social advances.

Summation models measure satisfaction both as a sum of the satisfaction with several elements of the experience, as well as at specific levels. This general measure of satisfaction is not tied to any prior recreationist expectation or motivation, but rather to physical elements of the environment (campsite condition, trail condition, information, and so forth). The research experience (Dorfman 1979, Heberlein 1977, Ditton et al. 1981, and others) however is not conclusive. Dorfman reported differing results when using summated measures and several individual measures. Ditton et al. also offer weak support for the hypothesis that overall satisfaction is the sum of several specific components. However the return to management in terms of the identity of the specific factors that can affect satisfaction has been high.

Need fulfillment models are the most robust in that they use standardized scales and have a sound foundation in clinical practice. (Harris 1984, Beard and Ragheb 1980, Pierce 1980, and others). These models explicitly recognize that people are motivated to act by the desire to fulfill several needs - tacit recognition of the multiple motivations/satisfactions notion. In terms of angling, these motivations are best represented by nine general dimensions of motivations that have been widely reported in the literature (Table 2). The degree to which people are motivated to seek and find specific elements of the experience/environment has been the underlying construct of much angler behavior and market segmentation work.

Addis and Erickson (1968) were among the first researchers to suggest that there was more to the fishing experience than just catching fish. Bryan (1974), Moeller and Engelken (1972), Knopf et al. (1973) suggest that anglers are motivated by four basic unmet needs: temporary escape, achievement, exploration, and experiencing natural surroundings. Driver and Knopf (1976) argue that the list of potential angler satisfactions-motivations is long, but that the basic ones are experiencing the out-of-doors, developing skills, pitting wits with a fish, being with friends, sharing skills, relaxation, learning, arousal, escape, trophy gathering, and using or testing equipment. Driver and Brown have methodologically evaluated and refined a list of 82 items arranged in 41 scales and comprising 17 dimensions. This is the most comprehensive inventory of motive states that is consistently used in the satisfaction, motivation and segmentation research.

Other more parsimonious arrangements of domains exist, and all are based to some degree on the work of Driver and Brown. For anglers and hunters three major classifications have been described. Vaske et al. (1982, 1986) working with data on waterfowl hunting and existing literature propose three basic dimensions of multiple-satisfactions - **wildlife, human interaction** and **nature/sport.** Decker and Connelly (1989) describe three primary motivational orientations for wildlife-related recreation: **Affiliative, achievement,** and **appreciative** and argue that for deer hunters, at least, the motivation for hunting is rooted in the areas of personal achievement, affiliation with friends and family, and appreciation of the outdoors, rather than in harvesting. Finally, Holland and Ditton (1992) propose seven "styles or policies" of angling: **Balanced experience, outdoors experience, freedom-relaxation, freedom-catch-relaxation, outdoors-relaxation, optimal feelings, and catch-excitement** based on an understanding of the contributions of catch and non-catch related aspects of angling.

While there is rather good agreement on the nature of the multiple satisfactions, the literature fails to successfully resolve the question of relative importance of fishing success (catch) to satisfaction. Even within the multi-satisfaction camp there are two major schools of thought relative to the role and importance of the catch. The first holds that catch is an unimportant part of the experience, and points to the evidence (much of which is summarized in Table 2) that shows non-consumptive dimensions consistently being rated more important by anglers.

A second view is that the size and number of fish are important. Stevens (1966) operationalized fishing quality as catch success. Weithman (1978), Weithman and Anderson (1978) and Brown (1968) extended this notion to include the number of fish caught, fighting ability, eating quality, and species. Buchanan (1983) found that catching fish was the dominant satisfaction sought by Wyoming anglers, but the multiple satisfactions associated with fishing were affected by the other, secondary activities, engaged in while fishing. Braaten (1970) reported that Washington anglers prefer fewer

large fish over many small ones. In Idaho a majority of anglers indicated a preference for catching fewer, but larger trout (Gordon et al. 1969). While Duttweiler (1976) found that lake anglers preferred several medium sized fish to one large or many small ones. Finally, Graefe and Fedler (1986) cite evidence from Colorado, Michigan and Virginia where angling participation rates dropped significantly after catch-and-release and size restriction policies were implemented.

Two dichotomies have been proposed to foster a better understanding of the contributions of the often conflicting attributes of angling and hunting experiences - consumption and non-consumption and their relation to satisfaction. Hammit et al. (1989) offer the concepts of "the hunt (harvest)" and "the hunting experience" that allow measuring satisfaction with greater accuracy. While a quality hunt may be most influenced by deer related variables such as population size, and structure, these same variables have little influence on the satisfaction with the overall quality of the hunting experience. Weithman and Katti (1979) proposed a similar distinction for angling - "the fishing trip" and "fishing (catch)," and found that fishing trips could be rated differently from fishing.

A final, and most promising approach is proposed by Fedler and Ditton (1986) that measures the consumptive orientation of anglers. They point that the greater variance in satisfaction typically reported for consumptive motives (a point borne out in this review: see Table 2) may provide a greater and more robust opportunity to explain satisfaction than the universally high satisfaction reported for non-catch variables. By measuring the specific affinity for catch across different segments of anglers they were able to show how satisfaction differed and was explainable. The consistent distinction of a population into high, medium and low consumption groups provided a useful means of analyzing an angling population on the basis of a managerially relevant concept. For example, the higher fish-trip satisfaction levels reported by low-consumptives can be attributed to the higher importance they place on the non-catch related motives. Escape, relaxation, natural settings are more easily attained on any given fishing trip than is catching one or many fish, or large fish. Thus, low consumptives should more consistently be satisfied with their fishing trip. It follows that this group should be less sensitive to management action such as reduce catch limits.

DIMENSIONS OF ANGLING SATISFACTION

As a prelude to being able to define quality angling experiences it is first necessary to identify those dimensions of the angling experience/environment that people are motivated to seek. A survey of studies that reported the individual "motivations/satisfactions" were examined (Table 2). The nine broad dimensions represent the types of motives that have been examined for angling studies since the early 1970's. These studies have been empirical based as well as a-priori studies. Because these studies used different response formats and were measuring different concepts any conclusions we draw must be tempered with great caution. However, some general insights can be can be had.

First, and this is most important, while it is tempting to isolate and focus on a single dimension, it is the unique packages made up of differing combinations of each dimension that best describes what motivates individual anglers, and what allows us to identify groups of anglers who share/seek similar needs.

Table 2. Major dimensions of angling experiences reported in a sampling of contemporary literature.

CITATION ⇨ / DIMENSION ⇩	Moeller & Engelken 1972	Knopf et al. 1973	Driver & Knopf 1976	Driver & Knopf 1976	Driver & Knopf 1976	Kennedy & Brown 1976	Driver & Cooksey 1976	Adams 1979	Graefe 1980	Gramann & Burdge 1981	Dawson & Wilkins 1983	Collins et al 1981	Hicks et al 1983	Buchanan 1983	Haworth 1983	Hudgins 1984	Manfredo & Anderson 1984	Harris & Bergersen 1985	Fedler & Ditton 1986	Loomis & Ditton 1987 *Tournament*	Loomis & Ditton 1987 *Sport*	Andersen 1990
A. Escape; relaxation; change		1[2]	1	1	2	1	1	2	1	1	1	1	1	1	2	1			1	1		1
B. Consumption; trophy	2					3		2	3			3	2	1		1	3	2	2	1	3	3
C. Skills; achievement			2		3	1	1	1		3		3	3	2			2		3	1	2	2
D. Challenge; thrill; excitement							3			2	2				2					1	2	2
E. Social opportunities		3	2		2	3		2	1		2	2	2	1			2		2	2	2	1
F. Solitude; introspection; privacy	2				3			2	1			1	2	2		1	2	1				
G. Nature; natural; wild	1	1	1	1		1	1		2	1	1	1	1	1	1	1	1	1	1	1	1	1
H. Explore; learn		1	2					2						2	2							2
I. Teach; control			2									3		2								

[2] 1 = Most important; 3 = Least important "*motivation*". Highly subjective because of different response formats and concepts being measured.

Second, the importance ratings (both the index used in the table, and the original measures used by the authors) reflect relative importance. That is, importance relative to the other motives measured at the time. Thus, a study that measured "social opportunities" and found it to be "least important" cannot be directly compared to a study that measured "social opportunities" and also measured "Solitude, introspection and privacy" and found the latter to be more important. However broad comparisons can be useful.

The table highlights the universal acceptance of the need for escape, relaxation and change, and for, nature, or natural or wild settings plays in motivating anglers. Not only have most studies included measures of these two dimensions, but most studies have also found these two to be the most important motivational factors. This suggests that focusing on the other, more variable components of the experience may allow greater discrimination between types of anglers, and allow more precise measures of angler satisfaction.

Roles of individual motivational factors in angling satisfaction

This section catalogues the salient findings of the relationships between general levels of importance of each dimension and pertinent characteristics of angling participation. This is accomplished by examining empirical findings within a "High - Low" importance dichotomy.

A. Escape; relaxation; change

Characteristics of High Importance	Characteristics of Low Importance
• Universally high	

B. Consumption; trophy

Characteristics of High Importance	Characteristics of Low Importance
• Limiting-out more important for anglers < 15 years and for bait users	• Fly anglers, especially those who tie their own flys
• Seeing fish important for those > 70	
• Catching, seeing fish/sign of fish/others catching fish does not necessarily lead to satisfaction	• Not catching, seeing no fish/sign of fish, not seeing others catching fish often leads to dissatisfaction
• Catching any fish is more important than limiting out, which is more important than landing a trophy fish	
	• Residents & locals less consumptive oriented
• Lower education levels	
• Successful consumptive oriented anglers more satisfied than unsuccessful consumptive oriented anglers	• Non-consumptive oriented anglers more satisfied than consumptive anglers
• More likely to be occasional anglers	• More likely to be very active anglers
• Often the dominant, or even sole motivation (= < complex or specialized)	• Likely to be one of many, often equally motivations (= > complex or specialized)
• Major characteristic of tournament anglers (compared to sport anglers)	
• Boat anglers	• Bank anglers

• Trophy Bass anglers	• Older anglers (>40 years)
• Less likely to support "rationing"	

C. Skills; achievement

Characteristics of High Importance	Characteristics of Low Importance
• Skill development most important for those < 20	
• Demonstrating high skill is more important for low income anglers	
• More likely to be active anglers	
• Roaded area anglers	

D. Challenge; thrill; excitement

Characteristics of High Importance	Characteristics of Low Importance
• More likely to be active anglers	
• Wilderness users, rafters	

E. Social opportunities

Characteristics of High Importance	Characteristics of Low Importance
• Family togetherness most important for women.	• Escape from the family most characteristic of 16-20 year olds.
• Bait anglers more likely to fish as a family	
• Meeting others more important for those > 70 (older anglers are more tolerant of others)	
• Intragoup contact is less negative than inter-group contact for most anglers	
	• Seek wild fish

F. Solitude; introspection; privacy

Characteristics of High Importance	Characteristics of Low Importance
• Crowding is setting sensitive	
• Intragoup contact is less negative than inter-group contact for most anglers	
• Bank anglers	• Boat anglers

G. Nature; natural; wild

Characteristics of High Importance	Characteristics of Low Importance
• Universally high, regardless of naturalness or wildness of the setting	
	• Basic yield anglers

H. Explore; learn

Characteristics of High Importance	Characteristics of Low Importance
• Wilderness anglers	• Wilderness non-anglers

I. Teach; control

Characteristics of High Importance	Characteristics of Low Importance
• Older anglers • Urban anglers	• Wilderness anglers

THE LITERATURE ON ANGLER SEGMENTATION

This section represents a preliminary analysis of the literature on angler segmentation based on the review of 95 articles[3] related to the topic Additionally, one annotated bibliography (Potter et al. 1973) and one contemporary literature review that was commissioned by the Norwegian Institute for Nature Research (Aas 1991) were consulted. This review presents a broad view of the major foundations of the segmentation literature and has three objectives: 1) to identify the major dimensions of angling that have been used to construct the typologies; 2) to evaluate the generalizability (external validity) of the segmentation for application or adoption in Idaho, and 3) to help formulate an approach for measuring and using angler segmentation in Idaho.

OBJECTIVE 1: To identify the major dimensions of angling that have been used to construct typologies.

WHAT IS SEGMENTATION?

Segmentation is a method of categorizing or classifying people or objects on the basis of unique and shared characteristics. The resulting segments (typologies, taxonomies) are two or more groups that have minimum within group variation and maximum between group variation. The segmenting variables (characteristics) must describe important dimensions of the object or activity being segmented. Besides providing valuable insight to the underlying dimensions (structure and function, for example) of what is being segmented, it also improves the efficiency of analysis by reducing populations from an infinite number of individuals to a small (typically 3 to 7) number of groups. Segmentation is most valuable if each segment (angler type) is shown to have different and unique affinities with an array of variables, including behavior, preferences for management actions, fishing histories and so forth. It is this relationship to management that makes segmentation such a valuable tool. By designing programs and formulating regulations

[3]Only 33 of these articles focused on or reported on segmentation.

that address the major motivations of a particular angler type managers can greatly enhance the efficacy of their programs.

Two basic approaches to segmentation are used; application of explicit rules and data derived.

1. Explicit rule segmentation is a rather superficial and simplistic approach based on simple and observable differences. In many early fishing studies such approaches were used, classifying anglers into bank and boat anglers, for example.
2. Data derived approaches are more robust and more common in the contemporary literature. They are typically based on cluster analysis and are of one of two types: a-priori and empirical. In a-priori clustering the researcher decides prior to sampling and analysis which dimensions the population will be clustered on and creates an instrument to do just that. Empirical clustering presents respondents with an instrument that contains multiple measures of the many dimensions thought to be important, and the final segmentation is based on an analysis of the data, no prior hypotheses about the number and nature of the segments are stated.

Of the two, empirical clustering is more robust and is especially valuable with diverse and dispersed populations. A-priori clustering is useful for site-specific clustering of relatively homogenous populations for which some baseline data is available.

APPROACHES TO ANGLER TYPING

Historically, fishing was part of a subsistence economy and fish were caught to eat; methods-of-take motivations and benefits other than food were largely irrelevant. As angling emerged as a non-subsistence activity of the leisure class the consideration of the many elements that make up sport fishing prompted managers, researchers, outdoor writers and even anglers themselves to place participants into groups based on how they fish, where they fish, and so forth (See Potter et al. 1973, for coverage of these papers).

Two major approaches to angler typing have emerged. The first is Bryan's specialization approach, based on how a person fishes (fishing history), and the second is Driver and Brown's recreation experience preferences (REP) approach that is based on why a person fishes (motivations).

Bryan (1977, 1979) developed his typology from a study of trout anglers in Montana and Idaho. He identified four types of anglers (Table 3) based on the degree of specialization and considers equipment and natural and social setting preferences as well.

Table 3. Bryan's angler specialization framework

Degree of specialization	Equipment orientation	Natural setting	Social setting
Occasionalists	Catch any fish on any tackle	Any water; ease of access	Family orientation, few fishing vacations
Generalists	Limit of trout with spinning gear	lakes, large streams, stocked waters	Fish with peers, short fishing vacations in region
Techniques specialists	large fish, specialized tackle (fly rod)	Streams, large fish	Fish with peers, extended fishing trips
Technique setting specialists	Precise and exacting conditions (e.g., spring streams with light tackle)	Spring streams, preservation	Fellow specialists as a reference group, center their lives around fishing

Although Bryan's conceptualization is a heuristic, intended to provide a basis for future thinking and organization, it is worth examining for one important reason: it shows rather simply, how the results of a well-conducted segmentation effort may be able to isolate and use the key differences between types of anglers to effect long-term management of the resource. A major, and yet untested, criticism of Bryan's hypothesis is that the maturation that his model implies may largely be situation driven (Brown and Siemer 1992) and not represent a true change in motivation but merely reflect the transient effect of what fishing settings were available. However, two recent operationalizations of the specialization hypothesis (Andersen 1990 and Chipman and Helfrich 1988) both suggest that strong links may exist between changes in specialization, the desired angling experiences (motivations) and preference for management and further muddies the water by raising the questions of what is changing: behavior or motivation?

While Bryan's approach, based on how one fishes, is widely cited, a second reasonably complimentary approach was developed, operationalized, tested and refined by Driver and Brown. Their approach, based on motivational psychology, groups people based on the specific experiences that they desire from participating in any form of recreation (reasons for fishing, for example). Their multi-attribute, multi-dimension approach has been widely used in outdoor recreation. This approach recognizes that people recreate for many specific rewards and by having people evaluate the importance of all these rewards the underlying motivational dimensions can be used to cluster together people who are recreating to achieve the same goals. The item pool (Driver 1977) consists of many items that are organized into scales based upon intercorrelatedness. Scales in turn are organized into domains. Typing is done at the domain level. A typical instrument uses multiple items from one or more appropriate scales ("sub-domains") covering several domains.

Besides these two dominant approaches, many researchers have attempted to segment anglers based on other constructs. Others have used hybrid methods in attempts to examine the linkages between the major components of each approach. A summary of these approaches is shown in Table 4. In the table, "Segments based on" refers to the dominant psycho-social dimension that anglers were segmented on. For example, "Specialization" refers to an attempt to use Bryan's concept of changes in history of use; "Consumptive" involves examining the consumptive dimension of anglers and so forth. Note: Many studies have used more than one dimension in their segmentation efforts; to examine this we refer you to Table 5.

The column labeled "Likely stability" presents our best attempt to categorize each basic application in high, medium or low stability. Stability refers to the likelihood that the results of studies using the approach and the segmentation variables will be stable if applied to similar situations outside the geo-social area in which it was conducted. This assessment DOES NOT constitute an evaluation of the generalizability of specific investigations, such as would be done by considering sampling, survey design, data analysis, and so forth. This table is intended to show which general approaches and applications are inherently most useful.

Table 4. Summary of segmentation approaches and the variables used in segmentation and notes on their stability.

APPROACH	SEGMENTS BASED ON	LIKELY STABILITY
Explicit rules	Specializations	Low - designed to show evolution
	Angler location (Bank-float)	Low
A-Priori	Attitudes	Low - attitudes are very ephemeral and superficial constructs.
	Consumptive orientation	High - if tied to motivations and not to situation.
	Economic	Medium - may only reflect participation
	Motivations, satisfactions	High -
	Socio-demographics, fishing party composition	Low - situation dependent. Related more to participation than to motivation

APPROACH	SEGMENTS BASED ON	LIKELY STABILITY
	"Quality" attributes, success	High - only at local level.
A-priori & empirical	Motivation	High
	Preferences for management	Medium - best used at local level with very specific alternatives. Will change with management.
	Specialization	Low - as operationalized
Empirical	Attitudes	Low
	Catch characteristics, success	Low - varied by nature
	Consumptive orientation	High - if tied to motivations and not to situation.
	Expectations & perceptions	High - only at the local level
	Frequency & length of trips, experience level	Low
	Motivation, Importance of fishing, satisfactions, benefits	High - if based on multiple measures
	Management preferences	Medium - best used at local level with very specific alternatives. Will change with management.
	Setting aesthetics, class & preferences	High - best at local level
	Specialization	Low - by design but HIGH as operationalized
Non-segmenting	Angler profiles	Low - not based on any underlying behavioral dimension.
	Catch profiles, success	Low
	Relative importance of 7 Motivation factors	Unknown
	Opinions	Low - very superficial construct

In general the most stable applications are those based on more robust conceptualzations using well documented psycho-social constructs such as motivations, attributes of success, and expectations. While the less stable ones are based on less stable constructs (attitudes) explicit rules, or constructs not directly related to angler behavior (socio-demographics, general angler profiles, etc.).

OBJECTIVE 2: To evaluate the generalizability (external validity) of the segmentation for application or adoption in Idaho

Table 5: Summary of Segmentation Approaches

AUTHOR	DATE	SCOPE	SEGMENTS BASED ON:	GENERALIZABILITY FOR APPLICATION IN IDAHO
Moeller & Engelken	1972	Local, general anglers, NY	Non-segmenting, relative importance of 7 factors	Simple, simplistic, lacks explanatory power
Knopf et al.	1973	Statewide, general anglers, MI	Empirical, Motivations, perceptions	Innovative approach replaced by more recent works.
Driver & Knopf	1976	Local, general anglers, MI	Empirical, Motivations	Multi-attribute, multi dimensions, robust. Innovative but replaced by more recent works.
Kennedy & Brown	1976	Local, UT	Empirical, Motivations, importance of fishing, expectations	Used open and close ended responses, fishing was not a primary focus
Bryan	1977	Local, trout anglers, MT, ID	Explicit rules, Specializations	Robust, innovative & exploratory, but has been improved by others to be
Adams	1979	Statewide, general anglers, WY	A-priori, "Quality" attributes, party composition	Exploratory
Dawson & Wilkins	1981	Marine, NY & VA	No-segmented, "Motivations"	Simplistic
Vaske et al.	1982	Varied, multi study, multi state	A-priori, consumptive orientation	Simple operationalization of success. Ignores multi satisfactions
Buchanan et al.	1982	Local, trout, WY	Empirical, Benefits, setting class	Tied to management, innovative, limited list of benefits used to segment anglers
Whitter et al.	1982	Local, Trout, MO	Non-segmented, Motives, opinions	
Buchanan	1983	Statewide, general anglers, WY	Empirical, "Satisfactions" (motivations?)	Exploratory

AUTHOR	DATE	SCOPE	SEGMENTS BASED ON:	GENERALIZABILITY FOR APPLICATION IN IDAHO
Hicks et al.	1983	Statewide, trout anglers, MO	A-priori, Motives, attitudes	Simple, simplistic, close ended
Driver, et. al.	1984	Statewide, general anglers WY, CO	Empirical, Motivations	Robust, repeatable and systematic, tied to management products. Innovative. Stability of segments is unknown but methods have been widely used successfully with other forms of outdoor recreation.
Hudgins	1984	Local, general angling, GA	A-priori, "Quality" factors, satisfaction, angling success	Simple (done with creel census), Flawed sampling, miss-defined attributes
Kreutziser	1984	Local, general anglers, Ontario	Empirical, Specialization, attitudes, socio-demographics	Robust analysis but used single attribute measures
Hudgins & Davies	1984	Local, general anglers, AL, GA	Non-segmented, success, angler and catch profiles	
Harris et al.	1984	Statewide, general angler, CO	Empirical, Setting preferences, catch characteristics	Innovative, tied to management and planning
Renyard & Hilborn	1985	Local, Salmon, BC	Explicit rules, Frequency	Simple, data is available, Recall errors, lacks explanatory power
Harris & Bergersen	1985	Statewide, general anglers, CO	Empirical, Motivations, management preferences, setting aesthetics	Robust, tied to management, innovative but recall error limits validity.
Fedler & Ditton	1986	Marine, TX	Empirical, Consumptive orientation, motivations, satisfaction, length of trip	Robust, multi dimensional, applicable to local sites, innovative. Successfully linked several dimensions of the marine angling experience together.
Graefe and Fedler	1986	Marine, MD, DE	Empirical, Satisfaction, success	Focus was on satisfaction, developed a comprehensive model of factors affecting overall satisfaction.

AUTHOR	DATE	SCOPE	SEGMENTS BASED ON:	GENERALIZABILITY FOR APPLICATION IN IDAHO
Scoolmaster	1986	Local, trout, MT	Explicit rules, Bank-float	Simplistic
Loomis & Ditton	1987	Marine, TX	Empirical, motivation, experience level	Robust, innovative. Examined angler diversity and related it to management.
Allen	1987	State and Local, trout anglers, MT	A-Priori, motivations	Tied to economic preferences and management.
Duffield & Allen	1987	statewide, trout angling, MT	A-priori, motivations, economic evaluation	Tied to economics.
Chipman & Helfrich	1988	Local, general anglers, VA	Empirical, & a-priori, specialization, motivations and preferences	Robust, multi-dimensional, tied to management. Identified "fundamental determinants" of sub groups. Innovative use of all major approaches to segmentation.
Connelly et al.	1990a & b	Lake Ontario, NY	A-priori, motivations	limited inventory of motivations used
Andersen	1991	Statewide, general anglers, UT	A-priori & empirical Specialization, motivations, preferences	Innovative use of all major approaches to segmentation

In general the studies for which the highest degree of confidence can be generated are largely empirical based clustering using motivations, angling history and management preferences to construct angler types. It appears that diversity of construct does lead to a higher chance for explaining variation in angler behavior. The scope of investigation (statewide or site specific, general angler or single species) appears to be less important. In part that may be due to the lack of full documentation of each study in its published form

OBJECTIVE 3: To help formulate an approach for measuring and using angler segmentation in Idaho.

The management of recreational fisheries is a complex science. The measurement of the behavioral environments of anglers is equally complex. Despite this complexity, and despite the apparent divergence of the major segmentation studies, several conclusions can be made or issues raised.

1. The term angling is excessively broad and fails to account for the diversity in motivations, behaviors, experiences and practice of the sport.

2. Almost all the papers we examined accepted, either tacitly, or by implication the notion of multiple dimensions of motivations for fishing (multiple satisfactions)

3. While the results of individual studies may not be directly comparable to each other because of differences in measurement and wording the major dimensions of a "generalized" fishing experience may include the four domains: natural settings/nature appreciation, using skills and equipment, escape work-time pressure and the need/ability to be social.

4. These four domains (components of the experience) have been arrived at through motivational studies, satisfaction studies, benefit studies using a variety of approaches and methodologies. They have also been equally well documented for other outdoor pursuits, notably hunting, backpacking and camping, and river running. Does this mean that they are so salient that documenting their presence is the social science equivalent of saying "fish need water?" (That they are not artifacts of survey procedures or researcher bias is borne out by the several studies using corroboration approaches (both close ended and open questions in the same survey).

5. This suggests two approaches:

    a. First, if they are indeed salient, then the next step is to adequately document the differing and specific needs of the different groups of anglers. This is the social science equivalent of determining the specific types of waters that individual species of fish need.

    b. Second, if these domains are common to many/most outdoor pursuits, then what domains are unique to angling. What does angling provide that other forms of recreation do not?

6. A segmentation based on these "unique-to-angling" domains may prove a better and more meaningful way to type anglers. One such approach that has been used is the consumptive orientation (Fedler and Ditton 1986). While a consumptive domain is not unique to fishing, <u>it is because fishing allows for so much more consumption</u> than does hunting, for example, that some scientists have chosen to measure it. Consumption itself represents several constructs: motivations, expectations, outcomes, benefits and satisfaction, and is thus a robust concept.

7. The value of any segmentation approach is in how its differences hold up against preferences for management. Because the management scenarios are developed and utilized at a site specific level they are even less generalizable than angler segmentation results. For instance, knowing that anglers in Wyoming prefer 9" trout is of little value in northern Idaho, because the anglers here are reacting to very different management and social regimes.

8. Most of the research has been case-study organized with little attempt to produce results that were generalizable beyond their socio-political environment. Thus this criticism should not be taken as denouncement of the approach, but rather as a statement of where the science is today. However, the outputs for critical thinking and conceptual advances have been higher because of this approach.

PRELIMINARY RECOMMENDATIONS FOR IDF&G:

1. Evaluate the consumptive dimension instrument that has been developed for Henry's Lake for possible use throughout Idaho, and for use at specific sitesl.
2. Link consumptive profiles to local/on-site management issues paying particular attention to possible generalizability to other similar sites within the state.
3. Conduct a statewide, multi-attribute, multi-measure empirically based segmentation of anglers to identify the broad range of angler experiences/markets offered in Idaho.
4. Link these consumptive profiles to motivational segments and behaviors.
5. Finally, less than five of the studies that we have reviewed to date included any form of monitoring or follow up to see if the segmentation did indeed result in more responsive management, fewer problems, higher quality fishing, or so forth. One way to advance the integrating of social and biological sciences to make resource decisions is to plan and conduct such a program. Such an approach would also facilitate the use of experimental designs for testing the utility of angler segmentation as a way to enhance angler satisfaction. An analysis of these existing reports is forthcoming.

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